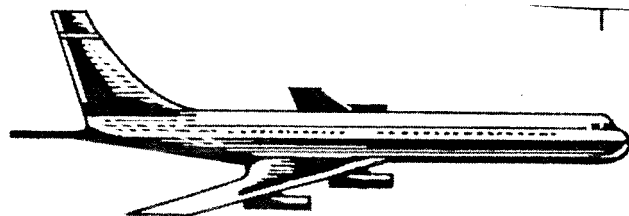
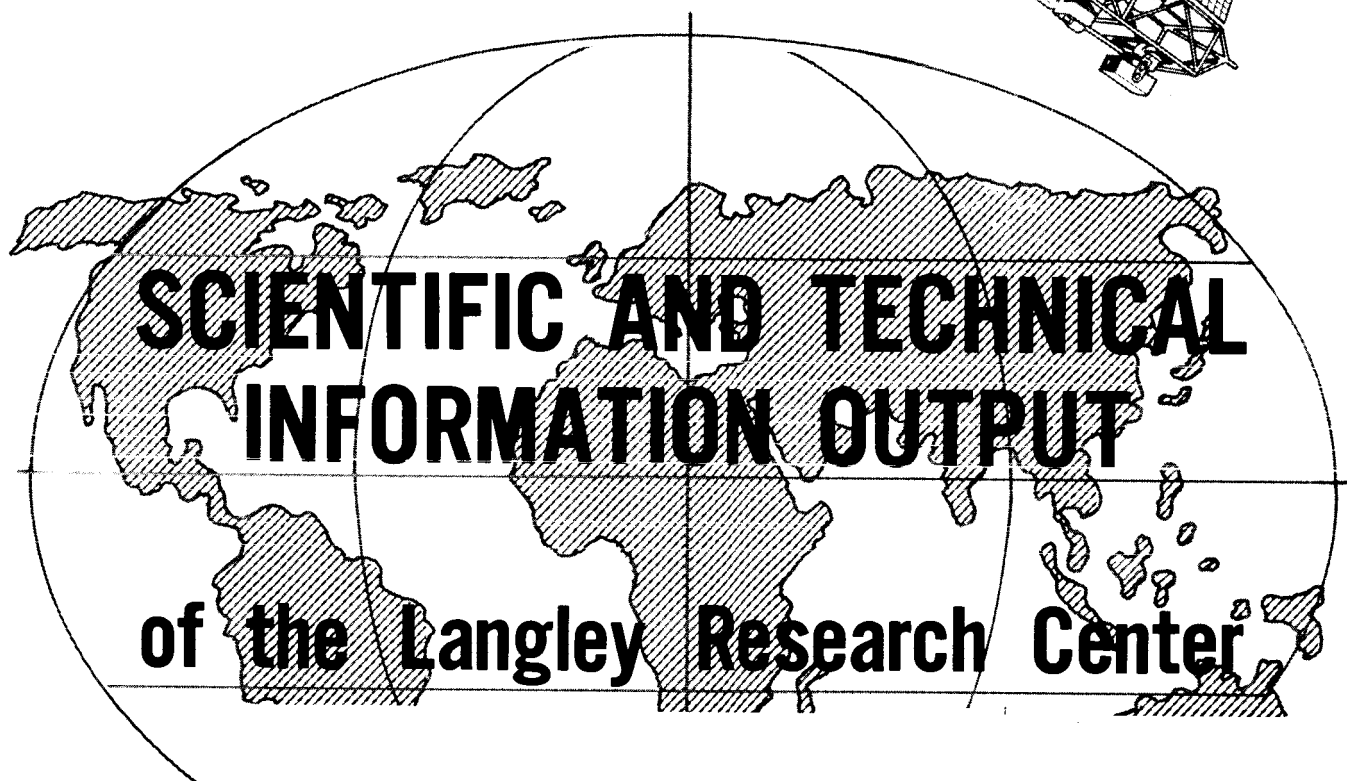
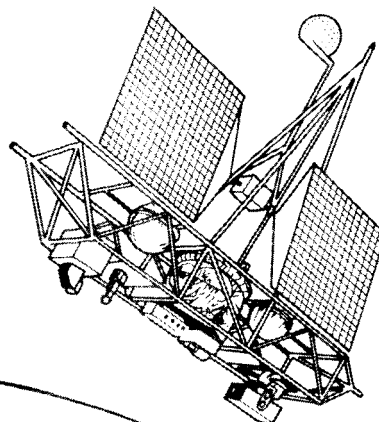


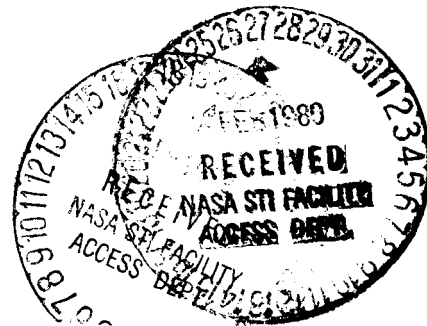


National Aeronautics and  
Space Administration

**Langley Research Center**  
Hampton, Virginia 23665



**FOR CALENDAR YEAR 1978**



(NASA-TM-80947) SCIENTIFIC AND TECHNICAL  
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## PREFACE

The Space Act of 1958 directs NASA to: . . . "Provide for the widest practical and appropriate dissemination of information concerning its activities and the results thereof."

In complying with the Act and also meeting their professional obligations, the Langley Research Center's 1360 scientists and engineers, supported by 1666 other employees, vigorously disseminate their research results through reports and articles and meeting presentations.

This document is a compilation of the Scientific and Technical Information that the Langley Research Center has produced during the calendar year of 1978. Included in this listing are NASA Technical Papers, Technical Memorandums, Contractor Reports, Conference Publications, Reference Publications, Special Publications, Journal Articles, and Technical Presentations made at Society meetings. NASA formal reports included in this listing are those that have been mailed and distributed to the ultimate user. In selecting Journal Articles, only those articles which were published in a Journal during the calendar year 1978 are included. Similarly, material presented at Society meetings was presented during the calendar year 1978.

Output totals for 1978 are: Formal Reports - 169; Contractor Reports - 269; Articles and Meeting Presentations - 672; and Quick-Release Technical Memorandums - 122.

The material presented here is listed first by Division and then under the following headings: (a) Formal Reports, (b) Contractor Reports, (c) Articles and Meeting Presentations, and (d) Quick-Release Technical Memorandums. Under each heading, the material is listed by authors in alphabetical order. If a report has more than one author and these authors are from different Divisions, the report is listed only once, under the senior author's name.

169  
269  
672  
122  
-----  
1232

# CONTENTS

	Page
PUBLICATIONS FOR –	
I. ANALYSIS AND COMPUTATION DIVISION . . . . .	1
II. FLIGHT DYNAMICS AND CONTROL DIVISION . . . . .	4
III. FLIGHT ELECTRONICS DIVISION . . . . .	9
IV. INSTRUMENT RESEARCH DIVISION . . . . .	16
V. TERMINAL CONFIGURED VEHICLE PROGRAM OFFICE . . . . .	22
VI. ACOUSTICS AND NOISE REDUCTION DIVISION . . . . .	23
VII. MATERIALS DIVISION . . . . .	29
VIII. STRUCTURES AND DYNAMICS DIVISION . . . . .	35
IX. AERONAUTICAL SYSTEMS DIVISION . . . . .	47
X. FLIGHT RESEARCH DIVISION . . . . .	52
XI. HIGH-SPEED AERODYNAMICS DIVISION . . . . .	55
XII. SUBSONIC-TRANSONIC AERODYNAMICS DIVISION . . . . .	64
XIII. ATMOSPHERIC ENVIRONMENTAL SCIENCES DIVISION . . . . .	76
XIV. SPACE SYSTEMS DIVISION . . . . .	81
XV. MARINE AND APPLICATIONS TECHNOLOGY DIVISION . . . . .	88
XVI. SYSTEMS ENGINEERING DIVISION . . . . .	94
XVII. OFFICE OF THE DIRECTOR . . . . .	95
XVIII. OFFICE OF DIRECTOR FOR PROJECTS . . . . .	97
XIX. OFFICE OF DIRECTOR FOR AERONAUTICS . . . . .	101
XX. OFFICE OF DIRECTOR FOR SPACE . . . . .	102
XXI. OFFICE OF DIRECTOR FOR MANAGEMENT OPERATIONS . . . . .	103
XXII. OFFICE OF DIRECTOR FOR SYSTEMS ENGINEERING AND OPERATIONS . . . . .	104

NASA LANGLEY RESEARCH CENTER  
Hampton, Virginia

CALENDAR YEAR 1978

I. PUBLICATIONS FOR ANALYSIS AND COMPUTATION DIVISION

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1. Dieudonne, James E.: Description of Computer Program and Numerical Technique for Developing Linear Perturbation Models From Nonlinear Systems Simulations. NASA TM-78710, 1978.
2. Lambiotte, Jules J., Jr.: An Implementation of the ADI Method on the STAR-100 Vector Computer. NASA TP-1282, 1978.
3. Schiess, James R.; and Singh, Jag J.: A Computer Program for Analyzing Unresolved Mossbauer Hyperfine Spectra. NASA TM-78633, 1978.
4. Anon.: Tools for Embedded Computing Systems Software. NASA CP-2064, 1978.

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5. Armstrong, Ernest S.: ORACLS - A Modern System for Linear-Quadratic-Gaussian Control Law Design. NASA TP-1106, 1978.
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8. Harris, Randall L., Sr.; Goode, Maxwell W.; and Yenni, Kenneth R.: Simulation and Flight Evaluation of a Head-Up Landing Aid for General Aviation. NASA TP-1276, 1978.
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3. Deckert, James C.; Desai, Mukund N.; Deyst, John J., Jr.; and Willsky, Alan S.: Reliable Dual-Redundant Sensor Failure Detection and Identification for the NASA F-8 DFBW Aircraft. NASA CR-2944, 1978. (NAS1-13914 The Charles Stark Draper Laboratory, Inc.)
4. Geissler, W. H.: A Feasibility Study of Orbiter Flight Control Experiments. NASA CR-158952, 1978. (NAS1-15141 McDonnell Douglas Technical Services Company, Inc.)
5. Hague, D. S.; Watson, D. A.; Glatt, C. R.; Jones, R. T.; Galipeau, J.; Phoa, Y. T.; and White, R. J.: ODIN System Technology Module Library, 1972-73. NASA CR-145328, 1978. (NAS1-10692 Aerophysics Research Corporation)
6. Harvey, C. A.; and Pope, R. E.: Insensitive Control Technology Development. NASA CR-2947, 1978. (NAS1-14476 Honeywell Inc.)

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9. Smyth, Richard K.; and Smyth, David E.: Basic Avionics Module Design for General Aviation Aircraft. NASA CR-158953, 1978. (NAS1-15284 MILCO International, Inc.)
10. Stengel, Robert F.; and Miller, George E.: Flying Qualities of an Aircraft With Strong Lateral-Directional Coupling. NASA CR-158961, 1978. (NAS1-13502 Princeton University)
11. Tiffany, Sherwood H.; and Newsom, Jerry R.: Some Programming Techniques for Increasing Program Versatility and Efficiency on CDC Equipment. NASA CR-3033, 1978. (NAS1-13500 Vought Corporation)

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2. Anderson, Willard W.; Groom, Nelson J.; and Woolley, Charles T.: The Annular Suspension and Pointing System. Presented at the AIAA Guidance and Control Conference, August 1978.
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8. Brown, Lawrence W.; and Moul, Martin T.: Shuttle Orbiter Flight Control System Evaluation. Presented at the AFFDL Symposium and Workshop on Military Flying Qualities, September 1978.

9. Harris, R. L., Sr.; Waller, M. C.; and Salmirs, S.: Runway Texturing Requirements for a Head-Down Cathode Ray Tube Approach and Landing Display. Presented at the AIAA Flight Simulation Technologies Conference, September 1978.
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11. Montgomery, Raymond C.; and Johnson, C. Richard, Jr.: The Dual Momentum Ring Attitude Control Device for Large Space Systems: An Example of Distributed System Adaptive Control. Presented at the 12th Annual Asilomar Conference on Circuits, Systems, and Computers, November 1978.
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15. Queijo, Manuel J.; Wells, William R.; and Keskar, Dinesh: The Influence of Unsteady Aerodynamics on Extracted Aircraft Parameters. Presented at the AIAA Atmospheric Flight Mechanics Conference, August 1978.
16. Spady, Amos A., Jr.; and Kurbjun, Max C.: Flight Management Research Utilizing an Oculometer. Presented at the 1978 SAE International Air Transportation Meeting, May 1978.
17. Srinathkumar, S.: Eigenvalue/Eigenvector Assignment Using Output Feedback. IEEE Transactions on Automatic Control, February 1978.
18. Tabak, Daniel; and Montgomery, Raymond C.: Comparative Evaluation of a UD-Factorized Filter in a Digital Flight Control System. Presented at the Sixteenth Annual Allerton Conference on Communication, Control, and Computing, October 1978.
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20. Waller, Marvin C.: Research in Pilot Scanning Behavior. Presented at the 50th Annual Convention of the National Technical Association, August 1978.
21. Young, J. W.; Schy, A. A.; and Johnson, K. G.: Prediction of Jump Phenomena in Aircraft Maneuvers, Including Nonlinear Aerodynamic Effects. Presented at the AIAA 4th Atmospheric Flight Mechanics Conference, January/February 1978.

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1. Forsyth, Donna L.; and Shaughnessy, John D.: Single Pilot IFR Operating Problems Determined From Accident Data Analysis. NASA TM-78773, 1978.
2. Groom, Nelson J.: Fixed-Base and Two-Body Equations of Motion for an Annular Momentum Control Device (AMCD). NASA TM-78644, 1978.
3. Hinton, David A.; and Shaughnessy, John D.: Adaptation of Time Line Analysis Program to Single Pilot Instrument Flight Research. NASA TM-78748, 1978.
4. Kiteley, Gary W.; and Harris, Randall L., Sr.: Instructor and Student Pilot's Subjective Evaluation of a General Aviation Simulator With a Terrain Visual System. NASA TM-78698, 1978.

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2. Beatty, Marvin E., III; and Meredith, Barry D.: Optical and Holographic Storage Properties of Fe-, Cu-, and Mg-Doped Lithium Niobate. NASA TP-1144, 1978.
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2. Baxa, Ernest G., Jr.: Investigation of New Techniques for Aircraft Navigation Using the OMEGA Navigation System. NASA CR-145303, 1978. (NAS1-14005 Research Triangle Institute)
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4. Belsterling, Charles A.: Design and Test of the 172K Fluidic Rudder. NASA CR-158974, 1978. (NAS1-14893 The Franklin Institute)
5. Bianchi, R.; Heath, A.; Marsh, S.; and Borusiewicz, J.: SeaSat-A Satellite Scatterometer. NASA CR-158956, 1978. (NAS1-14173 General Electric Company)
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9. Fujioka, J. K.; and Ely, W.: Development of the SeaSat-A Satellite Scatterometer Antenna. NASA CR-145299, 1978. (NAS1-14287 Aerojet ElectroSystems Company)

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2. Bavuso, Salvatore J.: Requirements for a General Computer-Aided Reliability Estimation Technique. Presented at the IEEE CS/FTC Workshop, Designing for the Unexpected, December 1978.
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4. Blume, Hans-Juergen C.; Swift, Calvin T.; and Kendall, Bruce M.: Advanced Systems Requirements for Ocean Observations via Microwave Radiometers. Presented at the AIAA Conference on "SMART" Remote Sensors, November 1978.
5. Bracalente, E. M.; Johnson, J. W.; Schroeder, L. C.; Jones, W. L. Jr.; and Grantham, W. L.: SeaSat-I Scatterometer Measurements - A Preliminary Report. Presented at the National Radio Science Meeting, November 1978.
6. Breckenridge, Roger A.; and Husson, Charles: Smart Sensors in Spacecraft: The Impact and Trends. Presented at the AIAA Conference on "SMART" Remote Sensors, November 1978.
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